

REMARKS

Prior to entry of this amendment, claims 1-2 and 4-8 are currently pending in the subject application. By this amendment, claim 1 is amended solely to more particularly recite the features recited therein. Support for the amendment to claim 1 may be at least found in paragraph [0041] of the original specification. No new matter is added. Entry and consideration of the amendment is respectfully requested.

Applicants appreciate the Examiner's acceptance of the drawings filed on October 24, 2005.

A. Introduction

In the outstanding Office Action Made Final, mailed January 9, 2006, the Examiner rejected claims 1, 2 and 4-8 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,771,473 to Hiramoto et al. ("the Hiramoto et al. reference"); and rejected claims 1, 2 and 4-8 under 35 U.S.C. § 103(a) as being unpatentable over the Hiramoto et al. reference.

B. Entry of Amendment Requested

Applicants respectfully request entry and consideration of the above amendment to claim 1. The Amendment does not add any new claims and does not raise new issues. Therefore, the Amendment does not impose an undue burden on the Examiner. It is respectfully requested that the Amendment be entered.

C. Asserted Rejections of Claims 1, 2 and 4-8

In the outstanding Office action, the Examiner rejected claims 1, 2 and 4-8 under 35 U.S.C. § 102(e) as being anticipated by the Hiramoto et al. reference; and claims 1, 2 and 4-8 under 35 U.S.C. § 103(a) as being unpatentable over the Hiramoto et al. reference. The rejections are respectfully traversed for at least the following reasons.

The Hiramoto et al. reference fails to disclose or suggest a magnetic tunnel junction device including the combination of features recited in amended claim 1 including, inter alia,

a pinned layer ... the pinned layer having a nitrogen-plasma-processed first surface on which the tunnel barrier is directly arranged, wherein a nitrogen-rich region exists at an interface of the first surface of the pinned layer and the tunnel barrier, the nitrogen-rich region containing more nitrogen than the pinned layer contains at a second surface of the pinned layer opposite to the interface, and the nitrogen-rich region containing more nitrogen than the tunnel barrier contains at a second surface of the tunnel barrier opposite to the interface.

The Hiramoto et al. reference appears to disclose a magnetoresistive element 10 that includes a first magnetic layer 1, an intermediate layer 2, and a second magnetic layer 3 (col. 7, lines 30-40). The Hiramoto et al. reference discloses that a process for forming the intermediate layer that includes n precursor formation processes and n being an integer of 2 or more (col. 5, lines 19-45). Thus, in the Hiramoto et al. reference, formation of the intermediate layer 2 involves at least two layers. The Hiramoto et al. reference further discloses providing a reactive species that reacts with the precursor (col. 6, lines 14-37). However, the Hiramoto et al. reference fails to disclose or suggest a pinned layer having a nitrogen-plasma processed first surface on which a tunnel barrier is directly arranged, as recited in claim 1. Claim 1 is at least advantageous for providing a magnetic tunnel junction with a high magnetoresistance (MR) ratio

and a low resistance area (RA) by arranging the tunnel barrier directly on the nitrogen-plasma processed first surface of the pinned layer.

For at least these reasons, applicants respectfully submit that the Hiramoto et al. reference fails to disclose or suggest all the features recited in independent claim 1 and all the features recited in each of claims 2 and 4-8, which directly or indirectly depend from claim 1. Thus, the Hiramoto et al. reference fails to anticipate or render obvious the features of claims 1, 2 and 4-8. It is respectfully requested that the rejections be withdrawn.

D. Conclusion

If the Examiner believes that additional discussions or information might advance the prosecution of the instant application, the Examiner is invited to contact the undersigned at the telephone number listed below to expedite resolution of any outstanding issues.

In view of the foregoing amendments and remarks, reconsideration of this application is earnestly solicited, and an early and favorable further action upon all the claims is hereby requested.

Respectfully submitted,

LEE & MORSE, P.C.

Date: April 10, 2006


Eugene M. Lee, Reg. No. 32,039

LEE & MORSE, P.C.
1101 WILSON BOULEVARD, SUITE 2000
ARLINGTON, VA 22209
703.525.0978 TEL
703.525.4265 FAX

PETITION and
DEPOSIT ACCOUNT CHARGE AUTHORIZATION

This document and any concurrently filed papers are believed to be timely. Should any extension of the term be required, applicants hereby petition the Director for such extension and requests that any applicable petition fee be charged to Deposit Account No. 50-1645.

If fee payment is enclosed, this amount is believed to be correct. However, the Director is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 50-1645.

Any additional fee(s) necessary to effect the proper and timely filing of the accompanying-papers may also be charged to Deposit Account No. 50-1645.